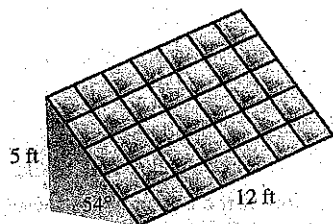
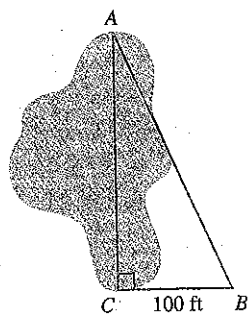


- 63. Group Activity Area** For locations between  $20^\circ$  and  $60^\circ$  north latitude a solar collector panel should be mounted so that its angle with the horizontal is 20 greater than the local latitude. Consequently, the solar panel mounted on the roof of Solar Energy, Inc., in Atlanta (latitude  $34^\circ$ ) forms a  $54^\circ$  angle with the horizontal. The bottom edge of the 12-ft long panel is resting on the roof, and the high edge is 5 ft above the roof. What is the total area of this rectangular collector panel?



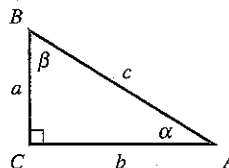
- 64. Height** The Chrysler Building in New York City was the tallest building in the world at the time it was built. It casts a shadow approximately 130 feet long on the street when the sun's rays form an  $82.9^\circ$  angle with the earth. How tall is the building?
- 65. Distance** DaShanda's team of surveyors had to find the distance  $AC$  across the lake at Montgomery County Park. Field assistants positioned themselves at points  $A$  and  $C$  while DaShanda set up an angle-measuring instrument at point  $B$ , 100 feet from  $C$  in a perpendicular direction. DaShanda measured  $\angle ABC$  as  $75^\circ 12' 42''$ . What is the distance  $AC$ ?



## SECTION 4.2 Trigonometric Functions of Acute Angles

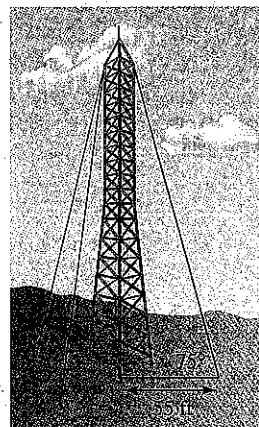
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In Exercises 55–58, solve the right  $\triangle ABC$  for all of its unknown parts.



55.  $\alpha = 20^\circ$ ;  $a = 12.3$       56.  $\alpha = 41^\circ$ ;  $c = 10$   
 57.  $\beta = 55^\circ$ ;  $a = 15.58$       58.  $a = 5$ ;  $\beta = 59^\circ$

- 59. Writing to Learn** What is  $\lim_{\theta \rightarrow 0} \sin \theta$ ? Explain your answer in terms of right triangles in which  $\theta$  gets smaller and smaller.
- 60. Writing to Learn** What is  $\lim_{\theta \rightarrow 0} \cos \theta$ ? Explain your answer in terms of right triangles in which  $\theta$  gets smaller and smaller.
- 61. Height** A guy wire from the top of the transmission tower at WJBC forms a  $75^\circ$  angle with the ground at a 55-foot distance from the base of the tower. How tall is the tower?



- 62. Height** Kirsten places her surveyor's telescope on the top of a tripod 5 feet above the ground. She measures an  $8^\circ$  elevation above the horizontal to the top of a tree that is 120 feet away. How tall is the tree?

